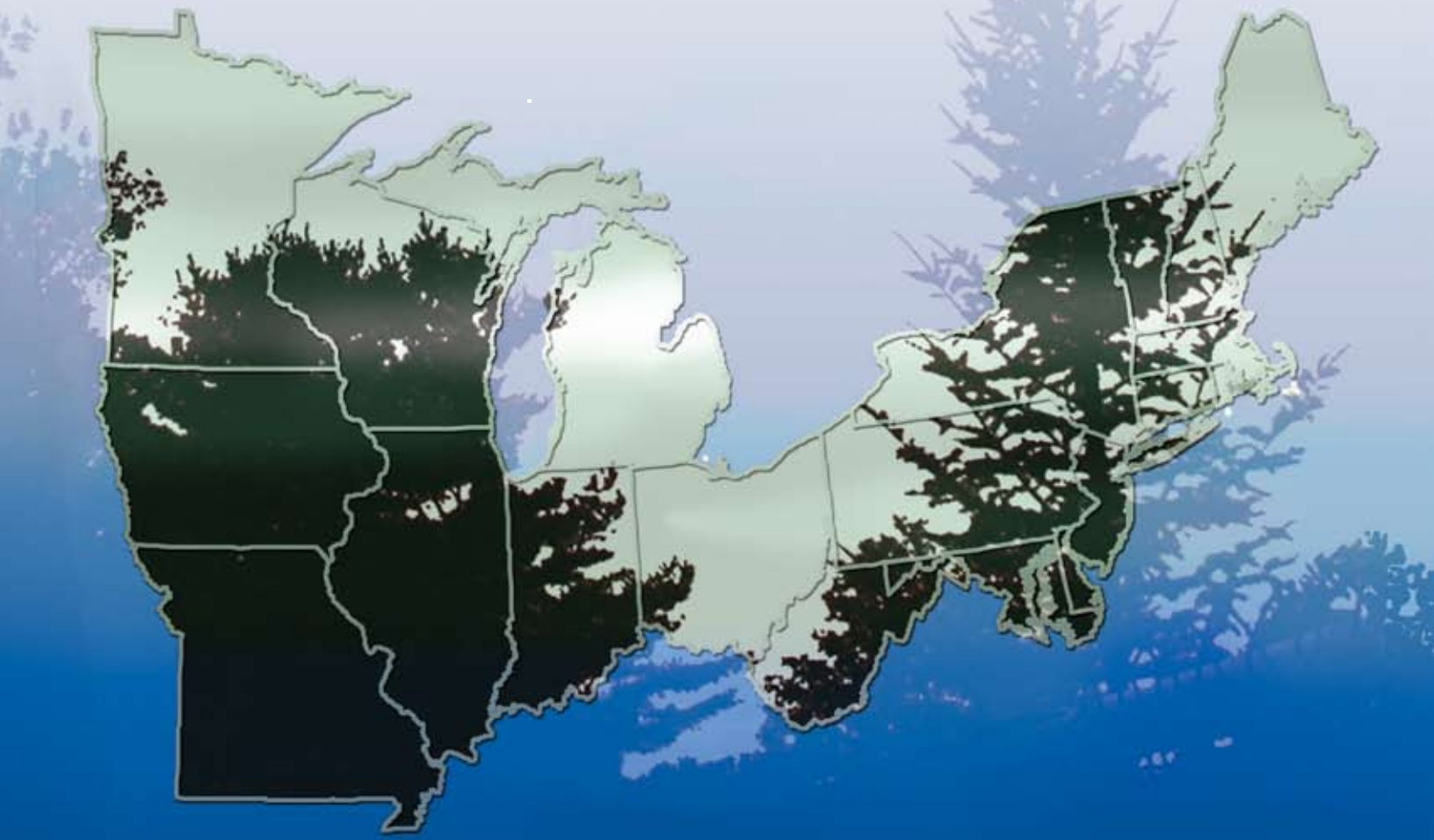
A Snapshot of the Northeastern Forests

United States
Department of
Agriculture

Forest Service

Northeastern Area
State and Private Forestry

NA-IN-01-06
October 2005



Preface

This publication offers an overview of the northeastern forests and some of the major challenges and opportunities for sustaining them, as identified by the Northeastern Area State and Private Forestry and the Northeastern Area Association of State Foresters. Our goal is to raise awareness of the condition of the forests as a starting point for landowner discussions and management actions aimed at ensuring a strong future.

The Northeastern Area State and Private Forestry is the major functional unit of the USDA Forest Service that encourages and supports sustainable forestry in the 20 midwestern and northeastern States and District of Columbia. The 21 State Foresters for these States and the District of Columbia make up the Northeastern Area Association of State Foresters. We work together and with other partners to promote wise management, protection, and sustainable use of the northeastern forests.

State and Private Forestry programs provide financial assistance and technical expertise in forest management to a diversity of landowners, public and private. For more information on northeastern forests and State and Private Forestry Programs, visit www.na.fs.fed.us.

Acknowledgments

This document would not have been possible without our great partnership with the Northeastern Area Association of State Foresters, and the efforts of individual State Foresters and their staffs.

A Snapshot of the Northeastern Forests

United States
Department of
Agriculture

Forest Service

Northeastern Area
State and Private Forestry
11 Campus Boulevard, Suite 200
Newtown Square, PA 19073

NA-IN-01-06
October 2005

www.na.fs.fed.us

Table of Contents

Introduction 6

Resource Challenges 8

- Changing Land Uses 8
- Invasive Species 10
- Water Quality 12
- Fire 13

Emerging Opportunities 14

- Financial Viability of Private Non-Industry Lands 14
- Markets for Ecosystem Services 15
- Forest Certification 17
- Forest Products Industry Infrastructure 18
- Demand for Recreation 19

Epilogue 21

Information Sources, by Topic Heading 22

Additional Resource 23

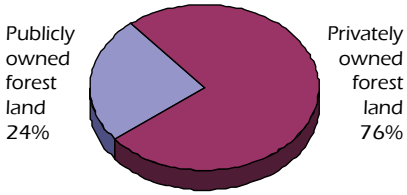
Introduction

From towering old-growth spruce in northern Maine to aspen saplings on the banks of the Mississippi River, America's northeast is home to an abundance of trees and forests. About 4 of every 10 acres of land in the area—some 170 million acres—are forested (see map). Some forests are diverse remnants of the nearly 300 million acres of forest that covered the region before European settlement. Others are hardworking plantations, pockets of habitat tucked away on homesteads and estates, or windbreaks calming prairie storms. Most are owned, not by Federal, State, and local governments, but by private landowners, including the forest industry (see pie charts—Forest Ownership).

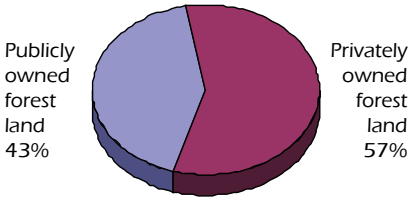
These tracts of land have long enriched our lives, providing abundant social, economic, and environmental benefits (see box next page).

Forest Ownership

Northeastern States

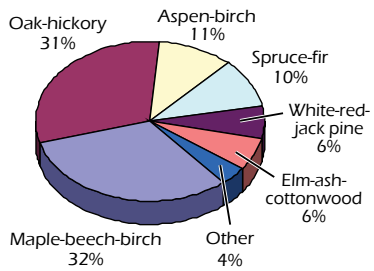


United States



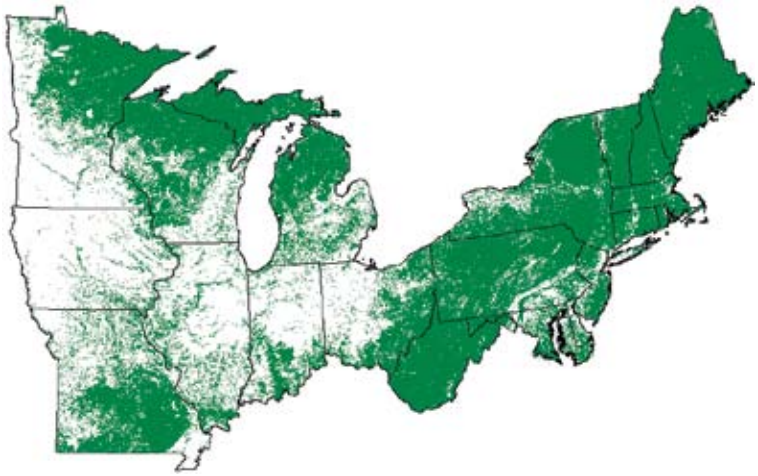
A larger proportion of forests is privately owned in the northeastern states than in the whole United States.

Forest Types



Forest types with deciduous trees prevail over forest types with conifers (spruce-fir and white-red-jack pine) in northeastern forests.

Northeastern Forests

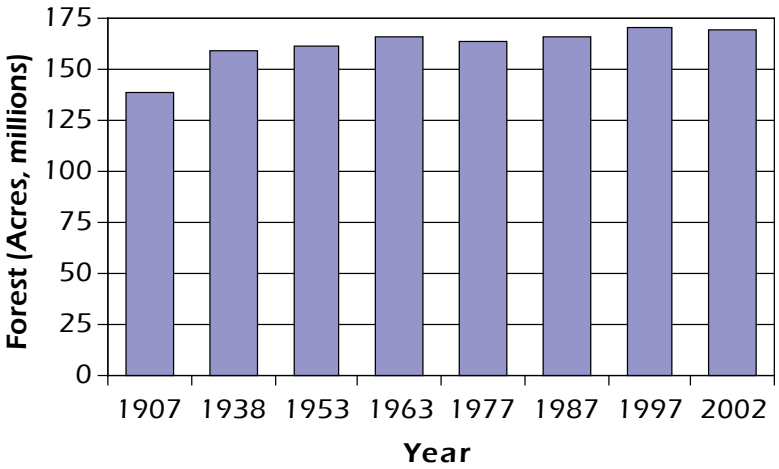


More than 40 percent of the 413 million acres of land in the northeastern United States is forest. Forest is land at least 1 acre in size and at least 10 percent covered by trees, including land that once had such cover and will be regenerated.

The northeastern United States is both the most forested and the most populated part of the country. As population grows and development sprawls and the economics of land ownership changes, the fate of the land is changing, too (see graph). It is being broken into pieces for development and bought up by interests that emphasize economic gain over forest management. It faces critical issues related to invasive species, water quality, and fire. It finds both challenge and opportunity in the form of financial viability of private non-industry lands, markets for ecosystem services, forest certification, changes in wood markets, and recreational demands.

Sustainable means meeting social, economic, and environmental needs today without compromising the ability to meet the needs of future generations.

Northeastern Forests



In the 1800s, much of the northeastern forests were cleared for farmland or harvested to help build a growing nation. During the 20th century, the forested area increased as trees overgrew former farmlands. Because of losses due to development, the growth in forested acreage has leveled off.

Benefits of Northeastern Forests

Aesthetics. Forests add beauty to the landscape and tranquility to our lives.

Clean water. Forests help keep lakes, rivers, wetlands, and ground water clean by soaking up rain, capturing pollutants, and holding soil in place.

Clean air. Trees absorb air pollutants. They make oxygen and remove carbon dioxide, a major greenhouse gas, from the atmosphere.

Habitat. Forests provide food and shelter for everything from mushrooms to moose. Thousands of plant species and hundreds of animal species—including mammals, birds, and amphibians—inhabit northeastern forests.

Recreation. Northeastern forests offer abundant opportunities to hike, hunt, ski, snowmobile, ride, run, birdwatch, bike, or just enjoy the view.

Wood. Nearly one-fourth of the nation's wood volume comes from the northeastern United States. The total value of shipments produced by wood-products industries in the northeast totaled nearly $117 billion in 2002.

Employment. Timber harvest and processing in the northeastern United States employs over half a million people and generates over $20 billion in income.

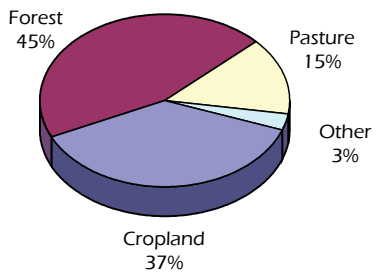
Non-timber forest products. Forests yield an abundance of products in addition to wood, including berries, mushrooms, craft materials, and maple syrup.

Microclimate Modification. Trees help cool their surroundings in summer and slow blustery winds. When planted strategically around buildings, trees can reduce heating and cooling needs. Forested areas reduce runoff and flooding and absorb noise.

Energy production. Trees are a valuable source of fuel production.

Resource Challenges

Land Lost to Development



During 1982-1997, 45 percent of the land developed in the northeast had been forested. "Other" includes rural land, rangeland, water areas, and Federal land.

Selling Out. For generations, forest products companies have owned and managed forest land. In recent years, due to changes in tax laws and the world of finance, these companies have sold large amounts of land to institutional investors such as banks, pension funds, and insurance companies and to groups known as timber investment management organizations.

Institutional investors hold 8 percent of forest land suitable for investment nationwide. A key question is whether the fiduciary responsibilities of these organizations will conflict with forest sustainability goals over the long term.

More Owners. In the northeast in 1993, 3.7 million family land-owners owned 93.4 million acres of forest. Ten years later, 4.8 million family landowners held 93.9 million acres of forest.

Northeastern forests influence and are influenced by a number of trends and forces. Prominent among these today are changing land uses, invasive species, water quality, and fire.

Changing Land Uses

America is growing. Between 1980 and 1990, the Northeastern U.S. population increased by 2.8 million; the following decade, it grew by 7.7 million more. Along with more people come more houses, more shopping malls, more roads, and more pressure to develop open space.

In recent years, the way we have grown has changed, too. Expansive lots and strip developments are favored over the dense neighborhoods and downtowns of years gone by. In other words, we're sprawling across the landscape.

Development

Development is slicing, dicing, and nibbling away at forest lands. From 1982 to 1997, 8.2 million acres of open space in the northeast were lost to development. Of these, 3.7 million acres had been forested (see pie chart—Land lost to development). Less forest means less of all of the benefits forests provide.

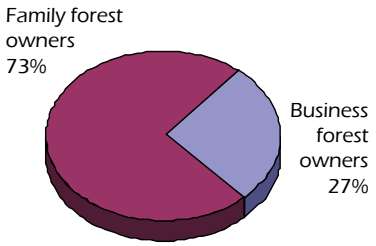
As demand for land grows, land prices, property taxes, and estate taxes rise, prompting landowners to cash in their equity (see box—Selling Out). The USDA Forest Service predicts that over the next 30 years, a dramatic increase in housing development is likely on more than 11 percent of private forests nationwide. Much of this loss is expected to occur in northeastern forests as developers stitch new neighborhoods to the edges of old ones, and individuals in search of their own piece of paradise carve sprawling homesites out of large tracts of trees.

Parcelization

Along with loss of acreage, development is also causing parcelization of forest land. Parcelization occurs when large tracts of forest land are divided up and sold to multiple owners (see box—More Owners). The forest itself may not change (at least not immediately) when it is broken into smaller tracts, but sustaining that forest becomes problematic. Parcelization makes it harder to manage for the big picture and the long term (see graph—Size of landholdings). It can decrease feasibility and profitability of timber harvest. Parcelization makes it more difficult to get messages promoting good stewardship to all the landowners involved.

More than one-quarter of northeastern forest land is estimated to be in metropolitan areas.

Privately owned forests



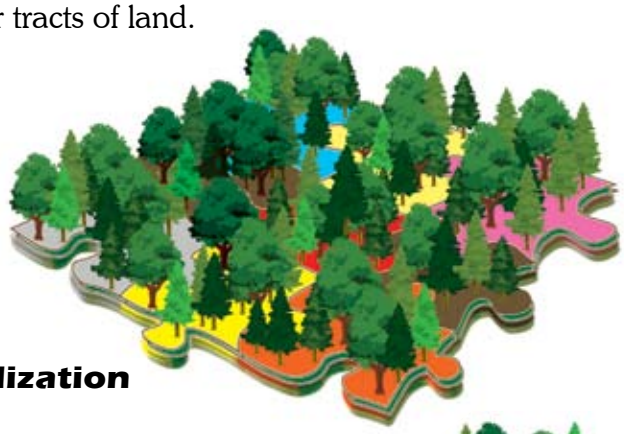
Almost three-quarters of the forest land in the northeast was held by family forest owners in 2003.

Protecting the Legacy.
To help stem the loss of forest, land trust organizations protect land from development through legal arrangements. A 1998 directory lists 831 land trusts in the northeast, protecting 1.7 million acres of forest and other land.

Fragmentation

In addition to being parcelized, forest land is also being fragmented—broken into pieces surrounded by altered or disturbed land, such as residential neighborhoods, roads, and shopping centers. Fragmentation reduces the overall amount of forest land. It also reduces the ecological value of what remains. Fragmented landscapes may not contain the optimal variety of food and shelter wildlife need to survive. Many experts believe that fragmentation is a primary cause of the loss of biodiversity in forested areas today.

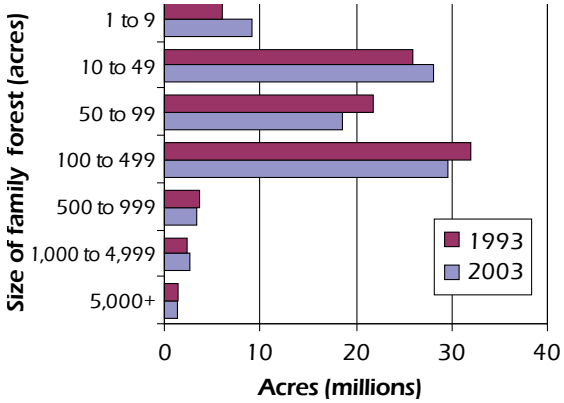
Like parcelization, fragmentation can decrease the profitability and feasibility of timber production due to higher per-acre costs of managing smaller tracts of land.



Parcelization

Fragmentation

Size of landholdings



The average size of landholdings is declining in northeastern forests. Between 1993 and 2003, landholdings of 1 to 49 acres increased, while landholdings of 50 to 499 acres decreased.

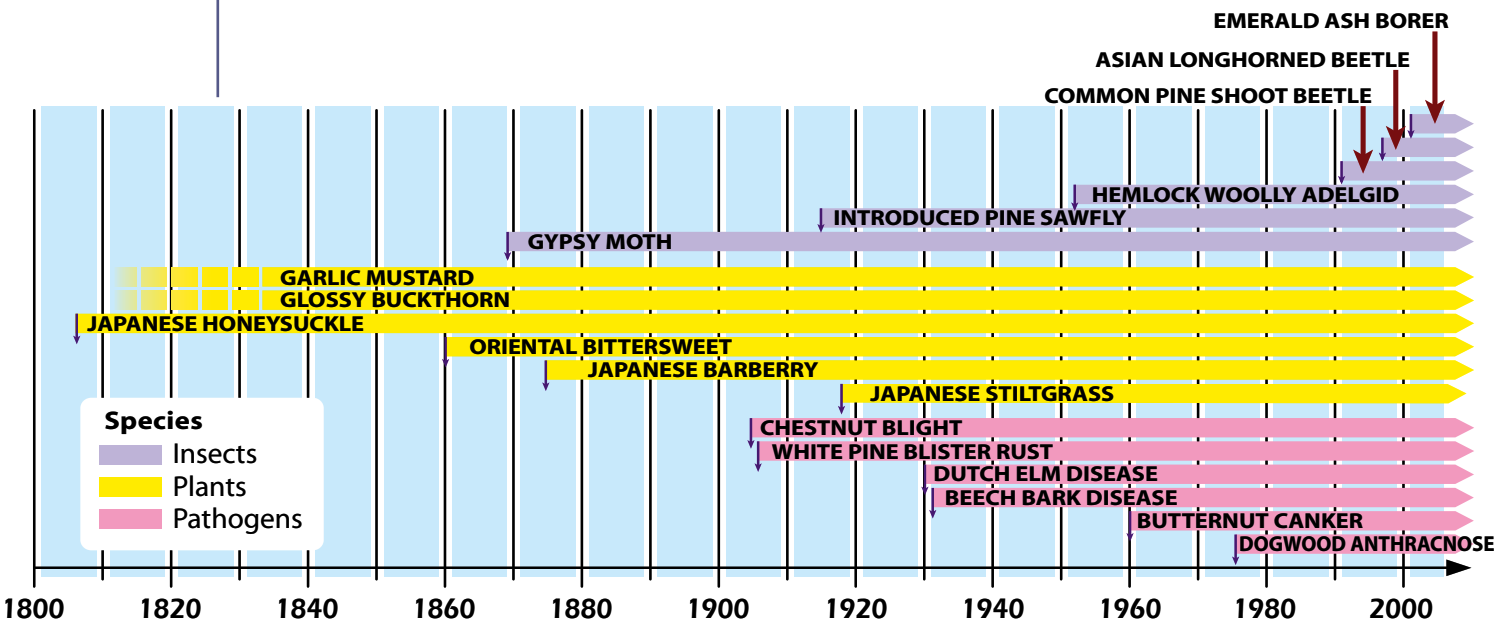
Invasive Species

Every ecosystem is home to a spectrum of species that interact in complex ways—competing and cooperating, eating and being eaten. Over countless millennia of coexistence, such species reach an equilibrium that allows them to remain viable despite the pressures they place on each other.

In many American forests, this equilibrium has been disrupted by the introduction of nonnative species. Some introductions have been deliberate. For example, the kudzu vine from Japan was planted in the 1930s for erosion control. Other introductions have been accidental. The European elm bark beetle, which contributed to the loss of millions of American elms by transmitting Dutch elm disease, may have hitchhiked from Europe in logs.

As they upset the ages-old balance among organisms, nonnative invaders make it hard for some native plants and animals to thrive. Invaders also degrade forests' ability to provide benefits such as timber and recreation. And the presence of invasives is pricey: Nationwide, economic losses due to invasive species (forest and other), combined with the cost of controlling them, add up to around $138 billion per year.

Since the 1800s, northeastern forests have been invaded by dozens of non-native plants, insects, and pathogens, from Europe, Africa, and Asia. The invasive species shown in the timeline are among the worst, based on their potential to cause native species to become extinct, their pervasiveness, and how hard it is to manage them.



Photos: Paul Wray, Iowa State University, www.ipmimages.org

Chestnut Blight

One of the greatest tragedies in the invasive-species history of northeastern forests was the introduction from Asia of chestnut blight fungus, which kills American chestnut trees. After its discovery in New York City in 1904, the fungus spread rapidly. By mid-century, 80 percent of American chestnuts—more than 3.5 billion trees—had been destroyed.

Before the blight, American chestnut trees (left) were a mainstay of eastern forests, making up one-fourth of the hardwoods on more than 200 million acres of forest land. They provided much-valued timber and food for wildlife, livestock, and humans.

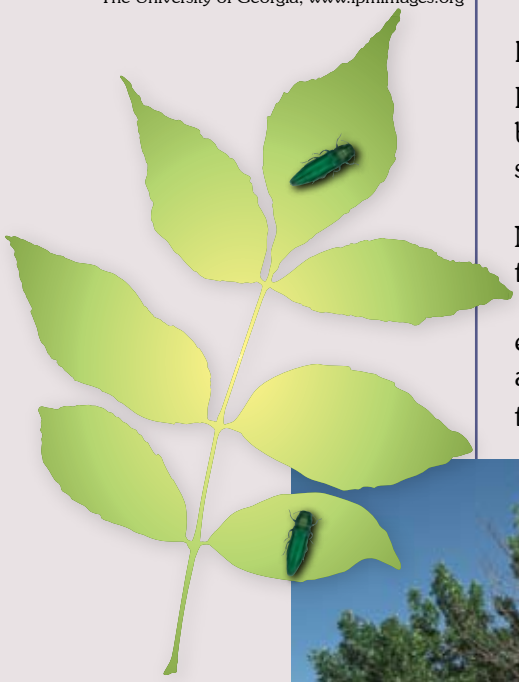
Scientists are working to breed resistant strains of American chestnut and to develop biological controls for the fungus. But even if they succeed, it will be many years before this tree again graces the landscape and our lives with anything near its former majesty.

Chris Evans, The University of Georgia, www.ipmimages.org

Garlic Mustard

Its name sounds like a gourmet delight. In reality, garlic mustard is trouble rather than treat—trouble for the native flora of American forests.

A biennial herb, garlic mustard was imported from Europe in the mid-1800s, most likely for food or medicinal use. It spread rapidly through northeastern forests since its introduction. As it sprouts, it crowds out native wildflowers such as wild ginger, bloodroot, hepatica, and trillium. It's also a threat to the West Virginia white butterfly, which lays its eggs on wildflowers known as toothworts. As garlic mustard replaces toothworts, this butterfly is having a harder time finding the native plants it needs to survive.



Emerald Ash Borer

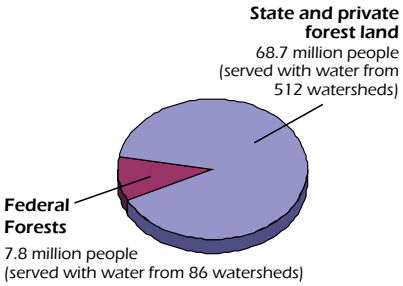
In 2001, residents of southeastern Michigan noticed that ash trees in the area had begun to mysteriously sicken and die. Investigators found metallic green, staple-sized insects they eventually identified as emerald ash borers from Asia.

No one knows exactly how and when this insect arrived in Michigan, though people think it may have stowed away in imported wood pallets. Its impact is more clear: arvae tunnel beneath the bark of infested trees, quickly killing them. To date, the emerald ash borer has wiped out more than 8 million ash trees in Michigan, Ohio, and Indiana. Because ash trees are popular for shade in northeastern cities, this pest threatens not only rural forests but urban forests as well.

Joseph O'Brien, USDA Forest Service, www.ipmimages.org

State and Federal agencies are working together to eradicate the emerald ash borer. Meanwhile, the USDA Natural Resources Conservation Service has been stockpiling ash seeds to provide a resource for replanting in the event the insect decimates existing populations.

Forests and water


State and private forest land
68.7 million people
(served with water from 512 watersheds)
Federal Forests
7.8 million people
(served with water from 86 watersheds)

Northeastern forests help protect surface water used by more than 76 million people. Most are served by watersheds under State or private ownership.

George M. Aronson

Forests help keep streams and rivers healthy by filtering sediments from runoff and providing cooling shade.

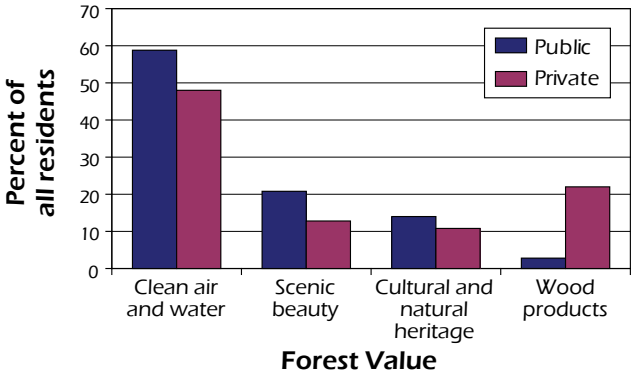
Water Quality

Forested watersheds in the northeast provide water for more than 76 million people (see pie chart). The health of a forest has a direct impact on the quality of ground and surface waters that arise from it. In general, watersheds with abundant forest have better water quality than those without. Forests help retain runoff, filtering pollutants and sediment from water flowing into streams and lakes. They help keep surface water cool and provide woody debris, sustaining fish and aquatic insects.

Forests also affect the movement of water. When rain falls on non-porous pavement, it flows rapidly into nearby water bodies, carrying pollutants and contributing to flooding. Forested areas gather water in rich, spongy soils and surface depressions, allowing it to filter slowly into ground water and surrounding streams, rivers, lakes, and wetlands.

State and private landowners play a key role in protecting water quality: Nearly 90 percent of the people who use water from forested watersheds in the northeast are served by watersheds on State and private land. Public agencies educate and encourage landowners to manage their land

Ranking of Forest Values



Residents of the Northeastern United States overwhelmingly rank clean air and water as the top values to consider when managing forests on public and private lands.

Water, Trees, and New York City. Forests up to 125 miles north and west of New York City are much on the minds of the city's Department of Environmental Protection officials as they work to ensure that the city's 9 million residents have a safe and wholesome water supply in the years ahead. Department officials are working with Federal, State, local, and private owners of forest land in the watershed to encourage voluntary efforts to protect water quality through education and training. The Department is also buying forested land and conservation easements to protect key lands, as well as managing city-owned land for water quality. By working to keep water flowing into its intakes as clean as possible, the city is potentially saving billions of dollars that would otherwise be needed to construct filtration plants.

in a way that protects the integrity of the waterways while providing timber production, recreation, and other forest benefits (see box—Water, Trees and New York City).

Historic forest land clearing degraded lakes and streams through erosion and sedimentation. Many waterways that were used to carry logs a century ago are still recovering.

Forest harvesting practices today are designed to minimize soil erosion and sedimentation. In fact, forest management has less impact on water quality than do agriculture and urban development.

Fire

Fire burns some 220,000 acres of land in the northeastern states annually.

Fire is a natural part of many forest ecosystems. It helps to renew forests, just as a good spring-cleaning helps to renew your home. And periodic, low-intensity fires can help reduce the risk of large, disastrous fires later on. But the benefits of fire must be balanced with the harm it can do to human life, property, and the forests' ability to provide benefits.

During and after World War II, a massive Federal, State, and local infrastructure was established to prevent and fight forest fires. As land managers have learned more about the value of fire, however, some wildfires are allowed to burn. Some fires are even planned and deliberately set, to help clear fuel from the forest and revitalize it, or to maintain wildlife openings.

As forest lands develop, both the potential for harm and the challenges involved in preventing and fighting wildfires grow. Public agencies invest substantial resources in providing homeowners at the urban-forest interface—where development meets or mixes with the forest—with the information and skills they need to minimize risk (see box—Cottonville Fire). Agencies also fight fires when they threaten life, property, and the values forests provide.

Cottonville Fire. On May 5, 2005, a grass fire burned out of control in a pine forest in Adams County, Wisconsin. Like many wildfires today, this one was far more complicated and costly than those of previous generations due to the fact that its path was peppered with homes. By the time the fire was out, it had destroyed 90 buildings. But many more were saved, and no lives were lost. One of the residents whose house survived reported that he had followed instructions to minimize risk of wildfire damage that had been distributed by the Wisconsin Department of Natural Resources.

Bryan Day: National Interagency Fire Center Image Portal

Emerging Opportunities

Along with changing land uses, invasive species, water quality, and fire, a number of emerging opportunities are likely to increasingly shape the fate of northeastern forests in the future. These opportunities include financial viability of private non-industry forest lands, markets for ecosystem services, forest certification, forest products industry infrastructure, and demand for recreation.

Chris Evans, The University of Georgia, www.ipmimages.org

Financial Viability of Private Non-Industry Lands

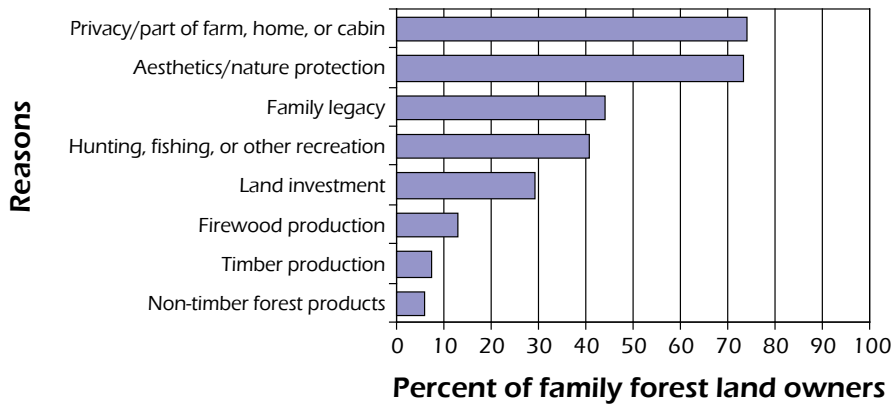
Much of the fate of northeastern forests lies with the 4.8 million family owners of forest land. In the face of loss of markets and rising land values, the ability of these landowners to maintain ownership of forest land and manage it in a sustainable manner increasingly depends on their ability to derive income from it.

The traditional means of earning money from forest land is through timber sales; however, timber production is not always the preferred option. And even if harvest is of interest to the landowner, it may be impractical or inadequately profitable. With rising land values, the more lucrative option increasingly is to sell the land for development.

A number of alternatives are emerging for producing forest-sustaining income from private non-industry forest land. Several of these include bolstering wood markets and developing markets for ecosystem services. An important option for enhancing the financial viability of private non-industry lands is the production and sale of nontimber products.

A 1997 study reported that Upper Michigan residents collect at least 138 different special forest products for personal use and income, including Labrador tea, acorns, blueberries, tree fungus, birch bark, fiddleheads, mushrooms, pine cones, reindeer moss, and rose hips.

Why Families Own Forest Land



Family forest owners have a variety of reasons for owning forest land.

The 10 major maple-syrup producing states in the northeastern forests sold an average of $34 million worth of syrup annually between 1994 and 1998.

Peggy Castillo

A number of nontimber products can be harvested from northeastern forests. Examples include these:

- maple syrup
- fruits and nuts
- berries
- weaving materials
- dyes
- mushrooms
- botanicals (see box—Goods from the Woods)
- craft supplies such as pine cones
- spruce boughs and decorative wood.

Demand for such products appears to be increasing. This demand can have a positive effect on forest sustainability if it provides landowners with the resources they need to maintain the land as forest rather than to develop it. The challenge is to make sure that the health of the forest remains a central consideration in the pursuit of alternative sources of income.

Goods from the Woods. An astounding variety of forest plants can be harvested and sold for medicines, flavorings, essential oils, and food preservatives. Eastern forests yield most of the estimated 100 tons of goldenseal root harvested annually. Much of America's $50 million ginseng crop comes from northern Wisconsin. Other botanicals harvested from northeastern forests include witch hazel, purple coneflower, black walnut, mayapple, and slippery elm.

Markets for Ecosystem Services

Some of the most important benefits from forest lands are the services they provide "for free." Healthy forests help minimize air pollution. They store and clean water and transform pollutants to benign compounds. They absorb carbon dioxide (CO_2)—a major greenhouse gas. They offer habitat for wildlife and beautify our surroundings.

Capturing Carbon. A major ecosystem service that forests provide is removing carbon dioxide (CO_2), a greenhouse gas produced by burning fossil fuels and other organic materials, from the atmosphere. As they photosynthesize, trees turn CO_2 into sugars that then become leaf and wood. This process reduces the amount of CO_2 in the atmosphere, and so its ability to alter the global climate. About half of a tree is carbon; a single large tree can store an estimated 3 tons of carbon. Carbon is also stored in other forest vegetation, on the forest floor, and in the soil.

Note: Around the globe, carbon sequestration is measured in metric tons. A metric ton (or tonne) contains 2,200 pounds. Multiply the number of metric tons by 1.1 to obtain tons.

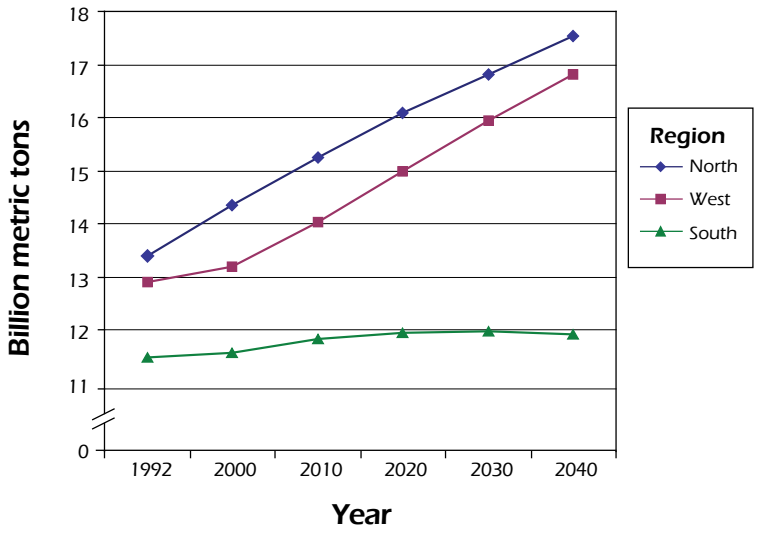
In 1994, New York City trees removed an estimated 2,007 tons of pollution from the air. The value to society: $9.5 million.

Maintaining forests, however, is not free. It costs money to buy and manage forest lands. It costs money to pay taxes on them. Without some return on their investment, landowners may find it difficult to keep forests in a condition in which they continue to provide ecosystem services.

Traditionally, timber production and recreation have allowed forests to help pay for their keep. Government payments, conservation easements, tax incentives, and outright purchase have provided additional tools for maintaining forests in a condition that conserves their ecosystem function. As land values rise, however, these tools become less effective.

When it comes time to decide the fate of a forest tracts, ecosystem services may not be adequately taken into consideration. In response to this dilemma, various groups are exploring options for reimbursing landowners for ecosystem services by viewing them as commodities that can be bought, sold, and traded.

Carbon Sequestration



Northeastern forests sequester more carbon than forests in any other part of the United States. In 1992, the forests held 13.3 billion metric tons of carbon. That number is projected to increase to 17.6 billion metric tons by 2040, due to tree growth.

A fledgling approach is being eyed to protect forests' ability to capture carbon in the form of carbon dioxide (CO_2) (see box on previous page—Capturing Carbon). Worldwide, governments and policy analysts are exploring the option of having CO_2 producers, such as power plants, pay landowners for the service their trees provide in removing the CO_2 from the atmosphere. Commodity exchanges have even been piloted for trading so-called "carbon credits." Efforts are underway to quantify how much CO_2 various kinds of forests capture under various management practices.

Forest Certification

How can you tell whether the forest products you buy have been produced with the well-being of the forest in mind? A generation ago, there was little you could do to "vote" for responsible forest management by your purchasing choices. Forest certification is increasingly offering consumers a way to encourage good stewardship.

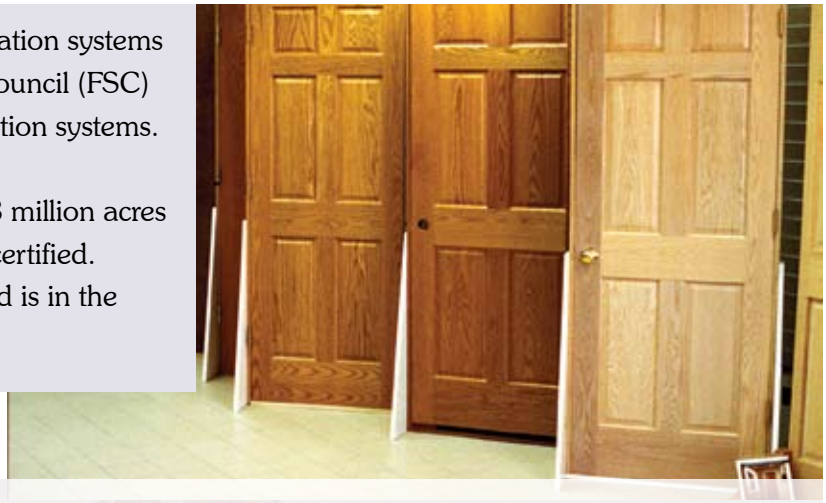
Certification is a voluntary process in which management of a particular forest is recognized as meeting certain environmental, economic, and social standards. Worldwide, a variety of systems have been established for certifying that forest lands are being managed sustainably (see box—Certification).

Forest products manufacturers and retailers can also be certified for "chain-of-custody" maintenance. This process confirms that they can trace the wood used to make their products back to certified forests. In the northeast, 93 companies and organizations are chain-of-custody certified.

Many forests that are not certified are still managed sustainably. And some small landowners may not be able to afford to go through the certification process. Still, forest certification holds huge potential to encourage sustainable forest management.

Certification. In the United States, two certification systems are most widely used: the Forest Stewardship Council (FSC) and Sustainable Forestry Initiative (SFI) certification systems.

Of all forest land in the northeastern states, 14.3 million acres are SFI-certified and 8.6 million acres are FSC-certified. Over half of the nation's FSC-certified forest land is in the northeast.



Great States. Seven states have already had state-managed land in northeastern forests certified by FSC and SFI. Others are at various stages of the certification process. The number of certified acres is expected to double in the near future. Here are the total acreages certified, by State, as of mid-2005:

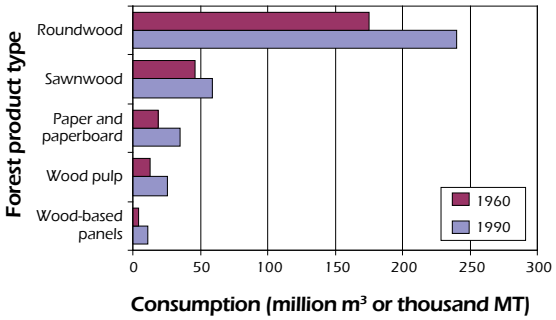
State	FSC certification	SFI certification
Maine	514,587	485,000
Maryland	28,988	29,935
Massachusetts	498,799	--
Minnesota	378,431	--
New York	717,285	--
Pennsylvania	2,099,149	--
Wisconsin	512,282	512,282

Annual per capita consumption of paper and paperboard rose an estimated 61 percent in the United States between 1960 and 1990, from 939 pounds to 1,519 pounds.

Forest Products Industry Infrastructure

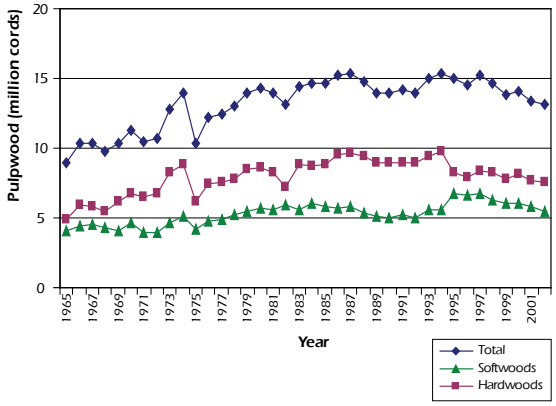
Northeastern forests have been sustained in large part by the forest products industry. It gives landowners an income sufficient to justify keeping their forests, while providing consumers with a renewable source of products, from toilet paper to two-by-fours. In recent years, however, the industry has been changing. And change has implications for sustainability. If markets are uncertain, landowners may lose incentive for keeping their forest land intact and sell it for development. A strong domestic wood products industry is an essential component of any plan to sustain the northeastern forests.

Forest Products Consumption



Estimated consumption of forest products in the northeast grew between 1960 and 1990. Roundwood is wood suitable for making primary forest products, such as sawlogs, logs for veneer, posts, pulpwood, and fuelwood. Wood pulp, and paper and paperboard are reported in thousands of metric tons (MT); the other products are in millions of cubic meters (m^3).

Pulpwood Production



Pulpwood production has grown in recent years in 11 northeastern states (IA, IL, IN, ME, MI, MN, MO, NY, OH, PA, and WI).

The forest products industry faces unsettled times. Some paper mills are closing down because of age, environmental concerns, and uncertainty about supplies of raw materials. Nationwide, 95,000 jobs have been lost in logging and the wood products industry since 1999. New technologies advancing the ability to use smaller trees, wood residue, and recycled materials affect the industry's demand for traditional forest products.

Forest products supply and consumption increased between 1960 and 1990 in the northeast in all categories (see bar graph). Between 1965 and 2002, production of pulpwood in 11 northeastern states grew by 46 percent (see line graph). Since 1995, however, gross output of forests has declined.

At the same time, other countries are becoming part of the picture. Wood fiber plantations beyond our borders are competing for American markets. More logs are being shipped out of the United States. Milling and processing are taking place far from the place the wood originated. And wood products imports are on the rise.

The bottom line is that there are a lot of unknowns in the forest products industry today. That makes it hard for commercial interests to invest in infrastructure in a way that ensures a solid future. It also makes it hard for owners of forest land to be confident that markets will be available in years to come to provide the economic return they need to hang onto their land today.

Demand for Recreation

Whether it's hiking, hunting, snowmobiling, going for a fall leaf drive, or simply hanging out in a hammock, more than 95 percent of Americans enjoy some form of outdoor recreation. Residents of the northeast lead the country in the amount of time they spend recreating on forest lands.

Recreation can be good for forests. It gives people a chance to appreciate them and, therefore, want to sustain them. It can provide a source of income so landowners can afford to keep forests as forests. About 13 percent of private non-industry forest land in the northeastern forests is open to the public for recreation—a larger proportion than in any other area of the country. Opportunities for landowners to earn income by providing recreational opportunities are likely to increase as the population grows and open space becomes increasingly scarce.

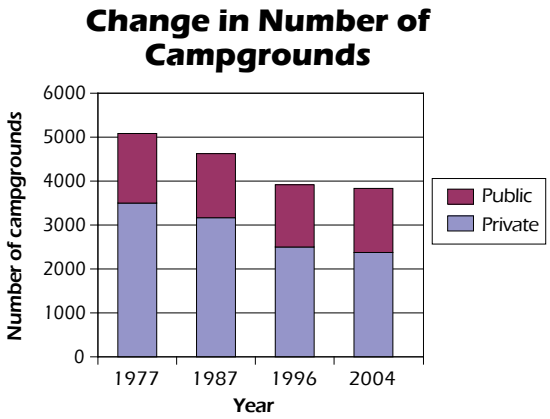
Many considerations are involved in opening a forest to recreation. Some forms of recreation affect the ability of the forest to provide for other forms of recreation. For example, a popular hunting area is probably not the best place for hiking. Some kinds of recreation, such as illegal off-highway vehicle (OHV) use, can harm a forest or its ability to provide other amenities (see box—Demand and Supply).

Demand and Supply.

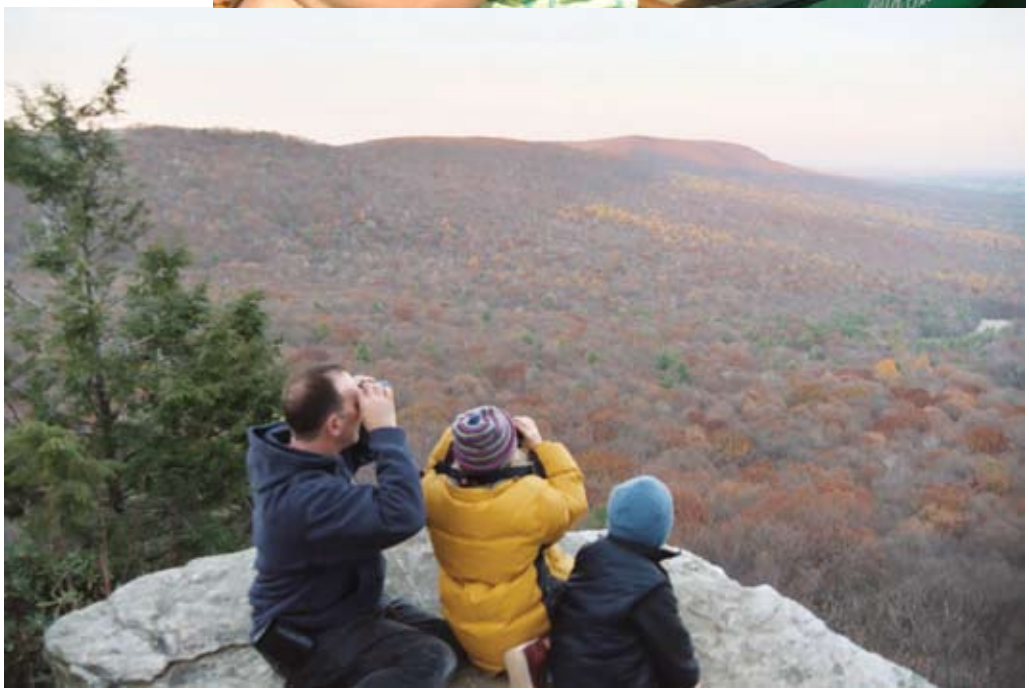
New Hampshire takes pride in providing opportunities for a wide range of trail-based recreation, from horseback riding to snowmobiling. A boom in recent years in off-highway vehicle (OHV) use has left the State looking hard for new ways to meet the needs of all users. A recently developed trail plan recommends adding 350 miles of new OHV trail to help minimize unmanaged and illegal OHV use.

The USDA Forest Service calls unmanaged recreation a major threat to forest health. When landowners make decisions about allowing recreational use of a forest, it's important that they consider what forms of recreation are compatible, what volume of it is appropriate, and the potential impacts.

The number of campgrounds on private land in northeastern forests has declined steadily since the 1970s, suggesting a shift away from recreation as an income producer for owners of private forest land (see graph). It remains to be seen whether that trend will continue, or whether forest land owners increase efforts to strategically include recreation in plans for their forests. The choice could have a substantial bearing on the fate of forests facing increasing pressure.



The number of campgrounds on private land in the northeast has declined in recent years.



In northeastern states 67 million people enjoy viewing and photographing wildlife and scenery each year.

Epilogue

The 170 million acres of forests that stretch across the Northeast and Midwest United States enrich our lives. They provide economic benefit, beauty, recreational opportunities, clean air and water, wood products, and more. And they face changes, challenges, and opportunities.

Considering the issues that face northeastern forests today, will they be able to provide rich benefits tomorrow? That depends … on us.

In 1910 Gifford Pinchot, the first chief of the USDA Forest Service, wrote in The Fight for Conservation, "The vast possibilities of our great future will become realities only if we make ourselves, in a sense, responsible for that future."

If we, as individuals and as a society, ignore the issues facing northeastern forests, they will face an uncertain future. But if we deliberately choose to sustain them and follow that commitment with action, we can create the great future Pinchot envisioned—a future in which forests and trees continue to grace lives and the landscape.

Information Sources, by Topic Heading

Introduction

Smith, W. B.; Miles, P. D.; Vissage, J. S.; Pugh, S. A. 2004. Forest resources of the United States. 2002. A technical document supporting the USDA Forest Service 2005 Update of the RPA Assessment. Gen. Tech. Rep. NC-241. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station; 137 p.

U.S. Department of Commerce, Bureau of the Census. 2005. 2002 Economic Census, manufacturing, geographic area series, industry statistics for the States. American FactFinder. http://factfinder.census.gov. (August 22).

U.S. Department of the Interior, U.S. Geological Survey. 2003. National Land Cover Dataset – 1992. http://landcover.usgs.gov/natlandcover.asp. (March 31).

Changing Land Uses

Butler, Brett J.; Leatherberry, Earl C. 2004. National Woodland Owner Survey, 2003 preliminary results. U.S. Department of Agriculture, Forest Service, Forest Inventory and Analysis. www.fs.fed.us/woodlandowners/publications/.

Dwyer, John F.; Nowak, David J.; Noble, Mary Heather; Sisinni, Susan M. 2000. Connecting people with ecosystems in the 21st century: an assessment of our Nation's urban forests. Gen. Tech. Rep. PNW-490. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 483 p.

Land Trust Alliance. 1998. 1998 National directory of conservation land trusts. Washington, DC. 210 p.

Schuler, Al. 2005. Changes in domestic supplies and markets for wood products. Presented at the Appalachian Society of American Foresters Winter Meeting; 26-28 January 2005; Columbia, SC.

Stein, Susan M.; McRoberts, Ronald E.; Alig, Ralph J.; Nelson, Mark D.; Theobald, David M.; Eley, Mike; Dechter, Mike; Carr, Mary. 2005. Forests on the edge: housing development on America's private forests. Gen. Tech. Rep. PNW-GTR-636. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 16 p.

U.S. Department of Commerce, Bureau of the Census. 2005. Census 2000 data sets; summary file 1 (SFI). http://factfinder.census.gov. (September 9).

U.S. Department of Commerce, Bureau of the Census. 1995. Population counts, table 1, urban and rural population, 1900 to 1990. Oct. www.census.gov/population/censusdata/urpop0090.txt. (September 9, 2005)

U.S. Department of Agriculture, Natural Resources Conservation Service. 2001. 1997 National Resources Inventory. Unpublished data on file, Resource Inventory and Assessment Division, Washington, DC. [Some information is available at www.nrcs.usda.gov/technical/NRI].

Invasive Species

MacDonald, William L.; Haynes, Clark S. 1997. The American chestnut's struggle to survive a biological invader. Land and Water 41(5): 43; Sept/Oct.

Michigan State University. 2005. Emerald ash borer. www.emeraldashborer.info/. (September 21).

U.S. Department of Agriculture, Forest Service. 2005. Four threats to the health of the nation's forests and grasslands. www.fs.fed.us/projects/four-threats. (September 19).

Virginia Polytechnic Institute and State University, Department of Plant Pathology, Physiology, and Weed Science. 2005. American Chestnut Cooperators' Foundation. http://ipm.ppws.vt.edu/griffin/accf.html. (September 9).

Water Quality

Cordell, H. Ken; Betz, Carter J. 2003. Recreation, tourism and other social, cultural and spiritual values; Indicators 35-37 and 42-43 of the Montreal process Criteria and Indicators. In: Darr, Dave, compiler. 2003 nation's report on sustainable forest management in the United States: A collection of supporting technical documents. Washington, DC: U.S. Department of Agriculture, Forest Service.

National Research Council, Commission on Geosciences, Environment and Resources. 2000. Watershed management for potable water supply: assessing the New York City strategy. Washington, DC: National Academy Press. 549 p.

U.S. Environmental Protection Agency. 1997. 1995 community water system survey. EPA–815–R97–001a. Washington, DC. 40 p.

Fire

U.S. Department of Agriculture, Forest Service. 2005. Wildfire reports. Washington, DC: Fire and Aviation Management.

U.S. Department of the Interior, Fish and Wildlife Service. 2005. Accomplishment report: Wisconsin wildfire rages through 3,410 acres. https://ars.fws.gov/regmap.cfm?arskey=15896. (September 9).

Financial Viability of Private Forest Land

Butler, Brett J.; Leatherberry, Earl C. 2004. National Woodland Owner Survey, 2003 preliminary results. U.S. Department of Agriculture, Forest Service, Forest Inventory and Analysis. www.fs.fed.us/woodlandowners/publications/.

Butler, Brett J.; Leatherberry, Earl C. 2005. National Woodland Owner Survey, 2004 preliminary results. U.S. Department of Agriculture, Forest Service, Forest Inventory and Analysis. www.fs.fed.us/woodlandowners/publications/.

Emery, M. R. 1999. Social values of specialty forest products to rural communities. In: Josiah, Scott J., ed. Proceedings of the North American conference on enterprise development through agroforestry: farming the agroforest for specialty products. St. Paul, MN: University of Minnesota, Center for Integrated Natural Resources and Agricultural Management: 25–32.

Foster, S. 1997. Medicinal plant development in the United States. In: Vance, Nan C.; Thomas, Jane, eds. Special forest products: biodiversity meets the marketplace. Gen. Tech. Rep. WO–63. Washington, DC: U.S. Department of Agriculture, Forest Service: 26–41.

U.S. Department of Agriculture, National Agricultural Statistics Service. 1995–1999. Crop production reports (PCP–BB). Washington, DC: Agricultural Statistics Board. http://jan.mannlib.cornell.edu/reports/nassr/field/pcp-bb/. [Reports released on the following dates: 12 June 1995, 12 June 1996, 12 June 1997, 12 June 1998, and 11 June 1999.] [Date accessed unknown].

Markets for Ecosystem Services

Birdsey, R. A.; Heath, L. S. 1995. Carbon changes in U.S. forests. In: Joyce, L.A., ed. Productivity of America's forests and climate change. Gen. Tech. Rep. RM–271. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 56–70.

U.S. Department of Agriculture, Forest Service. 2005. NE Forest Science Review: trees in the city; measuring and valuing the urban forest. Newtown Square, PA: Northeastern Research Station. Issue Number 3, Winter.

Forest Certification

American Forest and Paper Association. 2005. Sustainable Forestry Initiative (SFI) program participants that have completed third-party certification, Web version. www.afandpa.org/Content/NavigationMenu/Environment_and_Recycling/SFI/The_SFI_Standard/SFI_Certification_List_Website.pdf. (June 6).

Forest Stewardship Council. 2005. Forest Stewardship Council, United States, certified forests. www.fscus.org/certified_companies/index.php?num=*&type=forests. (June 7).

Hansen, E.; Bratkovich, S. 2000. Forest certification in the Northeast and Midwest. Unpublished document on file: U.S. Department of Agriculture, Forest Service, Northeastern Area State and Private Forestry, 1992 Folwell Ave., St. Paul, MN, 55108-1099.

Forest Products Industry Infrastructure

Howard, James L. 2003. U.S. timber production, trade, consumption, and price statistics, 1965 to 2002. Res. Pap. FPL-RP-615. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory. 90 p.

Schuler, Al. 2005. Changes in domestic supplies and markets for wood products. Presented at the Appalachian Society of American Foresters Winter Meeting; 26-28 January 2005; Columbia, SC.

U.S. Department of Agriculture, Forest Service. 1996. A report to facilitate discussion of indicators of sustainable forest management: a work in progress. Washington, DC: International Forestry. Unpublished report. 179 p.

Demand for Recreation

Cordell, H. Ken, principal investigator. 1999. Outdoor recreation in American life: a national assessment of demand and supply trends. [Champaign, IL]: Sagamore Publishing. 449 p.

Cordell, H. Ken; Betz, Carter J. 2003. Recreation, tourism and other social, cultural and spiritual values; Indicators 35-37 and 42-43 of the Montreal process Criteria and Indicators. In: Darr, Dave, compiler. 2003 Nation's report on sustainable forest management in the United States: a collection of supporting technical documents. Washington, DC: U.S. Department of Agriculture, Forest Service. 34 p.

U.S. Department of Agriculture, Forest Service. 2004. Four threats – quick facts: Unmanaged recreation. www.fs.fed.us/projects/four-threats/facts/unmanaged-recreation.shtml. (21 September 2005).

U.S. Department of Agriculture, Forest Service. 2004. National Survey on Recreation and the Environment, 2000-2004. Unpublished data on file, Recreation, Wilderness, Urban Forest, and Demographic Trends Research, Southern Research Station, Athens, GA.

Woodall Publishing Corporation. 2005. US Forest Service Forest sustainability work. aemerson@affinitygroup.com. (June 21). [Some information is available at www.woodalls.com].

Woodlot Alternatives, Inc. 2003. A plan for developing New Hampshire's statewide trail system for ATVs and trail bikes, 2004–2008. Concord, NH: State of New Hampshire, Department of Resources and Economic Development, Division of Parks and Recreation, Bureau of Trails. 73 p.

Additional Resource

For more information on all of the topics, visit www.na.fs.fed.us/sustainability.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.